turn when closed. The mixed lines show the actual direction of the eyes when closed and at the instant of opening. The complete lines show the direction of the axes of the eyes when open. *A* represents in both cases the eye closed, *O* the object.

There is one case which offers some difficulty to this explanation; unless, indeed, it is to be regarded as an illustration of the general principle formulated above that relaxation is inversely proportional to the effort of convergence. If, as in the instance represented in the second figure, the object be far to the right, but be fixated with the right eye rather than with the left, and then the left eye be closed and opened, we should naturally expect crossed images indicating convergence beyond the object. I have sometimes found this to be the case. Sometimes, however, I have observed no double images, or even at times uncrossed double images. It would seem that in these cases the closed eye in its strained position may be converged too much. This, however, is observable only at times; the regular results are double crossed images.

So far as convergence is concerned the open eye exerts the controlling influence; its position remains unchanged. But in accommodation the relaxation of the closed eye has an important influence on the accommodation of the open eye. If an object is fixated with both eyes, and moved away to the limit of distinct vision, it will be found on closing one eye that the outlines are no longer distinct. It is, for example, impossible to read print with one eye at a distance to which it could be just clearly seen with both eyes open. The figures on the moon grow very indistinct when one eye is closed. This indistinctness may be due, in part, to the enlargement of the pupil, for the pupil of the open eye is very much enlarged in sympathy with that of the closed. But this cannot be the whole explanation. For when one eye is covered up in such a way as not to exclude the light entirely the pupil of the fixating eye is not affected as much. The outlines, however, are indistinct even in this case, showing that the accommodation of the lens has undergone a change. Whether this change in the lens is one resulting in greater or less convexity I have not succeeded in determining. The fact that a voluntary accommodation for a nearer point does not, in my case, make the object clearer, but rather the contrary, would seem to lead to the conclusion that the lens has become more convex rather than less so. Yet this does not appear to be conclusive. The main fact, however, is that there is some change in the accommodation of the lens of the open eye when one eye is closed.

The bearing of these facts on many experiments in optics will be apparent. Wundt denies complete binocular convergence when one eye is closed, while Hildebrandt and Arrer* maintained the opposite. The truth seems to be that the closed eye follows the open eye to a certain extent, and to a certain extent obeys its own tendencies of relaxation. There is a change in the size of the pupil in both eyes and a change in the accommodation of the lenses.

CHAS. H. JUDD.

WESLEYAN UNIVERSITY.

A NEW NAME FOR THE NOVA SCOTIA FOX.

IN the proceedings of the Biological Society of Washington, Vol. XI., March 16, 1897, pp. 53–55, I described the large red fox that occurs in Nova Scotia (and perhaps other parts of the Canadian and Hudsonian zones in eastern North America). Unfortunately, I used the subspecific name *vafra* that is already in use for a fossil fox —the *Canis vafer* Leidy (Ext. Mam. Faun. 1869, p. 368).

It therefore becomes necessary to re-

* 'Philosophische Studien,' XIII., p. 116 seq. Other references given in the same place.

name the Nova Scotia animal, and I propose to call it *Vulpes pennsylvanica rubricosa* (Type No. 116, Bangs Coll., described under above reference as *Vulpes pennsylvanica vafra*).

Outram Bangs.

January, 1898.

THE AMERICAN CHEMICAL SOCIETY.

The sixteenth general meeting of the American Chemical Society was held with the Washington Section on December 29th and 30th. No place could have been more favorable for the meeting, as, outside of New York, Washington has the largest and strongest local section of the Society. As a result, this was the most largely attended meeting in the history of the Society. Every preparation had been made by the local committee and no meeting has been more successful or enjoyable. The sessions were held at the Columbian University and were opened by an address of welcome by President B. L. Whitman. The forenoons and Wednesday evening were devoted to the reading and discussion of papers. Among the papers read were the following:

Professor L. P. Kinnicutt, of Worcester, gave an interesting account of recent developments in the new methods of sewage purification, including the method by which a very considerable amount of the purification is due to giving the anærobic bacteria an opportunity to develop to the greatest extent.

An account was given, with illustrations, of Professor W. O. Atwater's respiration calorimeter, by means of which the total income and expenditure of heat and energy of the human body can be measured for periods of several days at a time.

C. A. Crampton, of the Treasury Department, read a paper on glucose in butter, illustrated by samples. Glucose is largely used as a preservative for butter to be shipped to tropical climates. The peculiar taste of some peoples was well illustrated by a sample of butter prepared for the island of Martinique, which was a bright orange-red color. Mr. J. P. Geisler, of New York, showed that the azo dyes which are used for coloring butter are very readily detected by absorbing with fuller's earth.

In the field of analytical chemistry Professor Francis C. Phillips read a paper on the determination of sulfur in gas-mixtures, giving description and illustration of an apparatus in which any desired amount of a gas (as natural gas) can be burned and the sulfur estimated as barium sulfate.

There was but one paper on didactic chemistry, by Professor Wm. P. Mason, of the Troy Polytechnic. In the very earnest discussion which followed the paper this question was raised: Is it wiser for a teacher to state scientific theories to his class dogmatically, thus giving them something tangible for a foundation, but knowing that, as they progress, they will have much to unlearn and modify; or should he confine himself strictly to statement of known truth, discussing conflicting theories with their arguments, pro and con, and, as a result, leave the mind of the student in a very hazy condition? It is not in chemistry alone that this difficulty arises.

Of papers devoted to pure chemistry, mention may be made of a series of papers on physical chemistry from the Cornell University laboratory; a discussion of the compounds of the higher haloids of elements of the Group IV., by J. F. X. Harold, of the University of Pennsylvania; a paper on the atomic weight of zirconium, by Professor F. P. Venable, of the University of North Carolina, and one on the chemistry and crystallography of some new rutheno-cyanids, by Jas. Lewis Howe and Professor H. D. Campbell, of Washington and Lee University.

President Charles B. Dudley's address on